

Transit Construction Costs Followup

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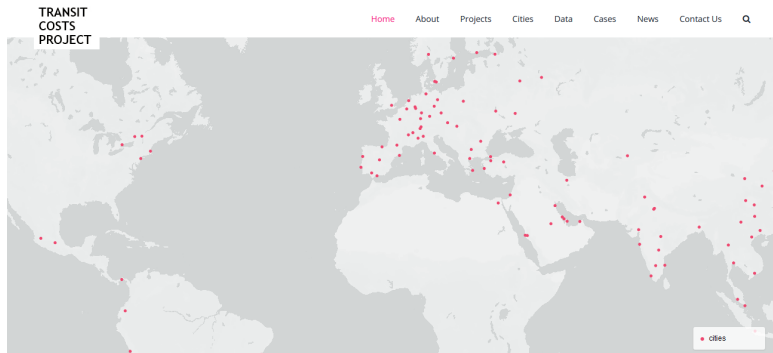
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Introduction

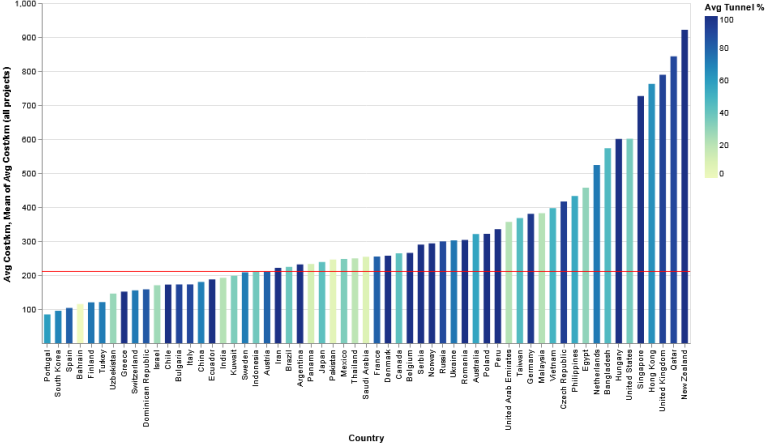
In February of this year, we published a report about how and why construction costs for subways vary greatly between countries.



Our first case study is out! Check out "[The Boston Case: The Story of the Green Line Extension.](#)"

Source: <http://transitcosts.com>

Costs by Country



Costs in Different Countries

Lesson #1 from our database: costs are primarily national (sometimes city-specific), so subways in the same city cost about the same, and usually also in the same country.

A dummy variable that takes the value 1 in the Anglosphere and 0 elsewhere has a correlation of 0.4 with cost per km, more than any other (the tunnel percent is only 0.15).

That and other context tells us that cost differences are almost entirely institutional, not geological.

The differences are massive: Southern European subways are around \$150-200 million/km, medium-cost countries (France, Germany, China) around \$250-350 million/km, the Anglosphere is \$600+ million/km, New York is \$2+ billion/km.

Why Costs Matter

High construction costs lead to building less, and low construction costs lead to the opposite.

In New York, the IND (1930s) cost inflation-adjusted \$180 million/km (contemporary London, Paris: \$40) and ran out of money to build Second Avenue Subway. Costs kept rising in subsequent generations and there was never enough.

Stockholm built the 104 km (57 km underground) T-bana in the 1940s-70s for \$3.6 billion; higher-cost cities this size could never build such a system.

Medium-cost Paris is building a 200 km (160 km underground) driverless suburban metro system for \$60 billion, about six years' worth of New York MTA capital investment over 15 years.

Case Studies

In addition to the large-N database, we conducted five in-depth case studies:

- ▶ New York Second Avenue Subway: highest costs in the world
- ▶ Boston Green Line Extension: light rail for the cost of a subway
- ▶ Stockholm Nya Tunnelbanan: low but rising costs
- ▶ Italian cities: generally low and stable costs, even falling since the 1990s
- ▶ Istanbul Metro and Marmaray: low costs due to very good public planning

Why Do Costs Differ?

The differences are institutional, and solving them requires American cities to consciously imitate low-cost places (none of which natively speaks English).

- ▶ Overbuilding: New York stations built too big for the trains they serve (2.1x)
- ▶ Systems: low standardization raises the costs of systems (1.3x)
- ▶ Labor: the Northeastern US has severe overstaffing of blue- and white-collar workers (1.5x)
- ▶ Procurement: the ongoing privatization of planning doubles Anglo procurement costs (1.9x)
- ▶ Soft costs: Anglo soft costs are atypically high (1.2x)

Stations and Tunneling

The ratio of civil infrastructure costs to systems and finishes in Stockholm, Milan, Rome, Paris is about 3:1.

In New York, it's 53:47.

The New York premium is small in tunneling and very large in stations, consistent with a station-specific New York premium of a factor of 3.

Second Avenue Subway stations are 2-3 times too big for the trains, and two out of three are also built with expensive deep-mining techniques instead of cut-and-cover.

Labor

In Sweden, Italy, and Turkey, labor is 20-30% of hard costs.

High Swedish wages (about \$90,000/year for miners in gross salary; benefits and taxes double this) match high Swedish labor productivity in construction.

In the Northeastern US, labor is 50% of hard costs: wages and benefits are similar to those of Sweden but labor productivity is lower than in Turkey.

The reasons include blue-collar union overstaffing and specific institutional problems (rigid overtime, seniority systems, lack of mobility, unions as a veto point), but also white-collar overstaffing: GLX employed a supervisor per 1.8 line workers (New England private-sector norm: 1 per 2.5-3), and utility conflict forces white-collar supernumeraries.

Procurement

The Anglo world has privatized state planning, leading to a cost explosion. Infrastructure construction is best done through a top-down, state-led program. US/UK consultants are pushing a program that does not work, which we call the globalized system.

Traditional	Globalized
Design-bid-build	Design-build
Itemized contracts	Fixed price contracts
Public-sector risk	Private-sector risk
In-house expertise	Greater use of consultants

The globalized system has been adopted in the last 25-30 years out of dialog between London, Singapore, and Hong Kong consultants teaching one another bad practices, and is exported everywhere the UK has soft power.

Project Delivery

The lowest-cost countries consistently use the following procurement system:

- ▶ In-house control: little privatization of planning and risk to the private sector
- ▶ Technical scoring: contracts are given by a technical score (50-80% of bid), rather than lowest-bid
- ▶ Itemized costs: changes are pre-priced, reducing change order friction (Bolotnyy-Vasserman, Ryan: 10-20% cost savings)
- ▶ Flexibility: builders can do substantial changes to the design (des-bid-ign-build)
- ▶ Fast response: in-house staff can make quick decisions if a change is needed, without needing to go through a consultant or senior manager
- ▶ Limited contingencies: projects are rated on absolute costs, not overruns

The Work Continues...

We wrote the main of our report in the fall of 2022, and since then have talked to many more people at various levels - for example, Eric knows much more about Seattle now than we did then.

So what would we add to our analysis?

Last-Minute Demands

American projects have a big OPM (other people's money) problem: petty local departments demand extra money and rate themselves on their ability to grab surplus. But we've since seen some examples of last-minute demands for OPM.

Example 1: while American fire codes are identical to Turkish and Chinese ones and similar to Spanish ones, municipal fire departments sometimes demand construction in excess of code and threaten to withhold approval, even after the Full Funding Grant Agreement (FFGA) is signed, and got it in suburban Seattle.

Example 2: holdups in last-minute permitting for the Dallas Silver Line are said to cost \$150,000 per day as the city demands OPM for betterments.

Public Officials and Consultants

Response to our report from politicians, senior civil servants, etc. has been varied, and some people in power are interested in doing better.

But.

There's a group of people who work for the government and just don't like the government very much and believe private consultants know better.

We saw glimpses of this in 2022 and much more of this recently, but, US/UK consultants are generally only aware of projects that hire consultants and therefore say false things with perfect confidence – they only see the globalized system and don't know how the traditional system works.

Learning from Others

RENFE built its extraordinarily low-cost high-speed rail system through in-house action and imitation of France caused by an inferiority complex.

But the US has a global superiority complex, not an inferiority complex.

Even groups who want to do better try to benchmark exclusively within the US, and one person even asked us if there are good American projects (there more or less aren't) because it's hard to get Americans to learn from Europe.

Questions

Any questions?